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ABSTRACT

The Keller Plan is a method of structuring a course so as to achieve high efficiency in terms of student learning. This method of teaching is sometimes referred to as Personalized System of Instruction (PSI). The materials of a course of study are divided into several sequential units. Study guides are provided that include an introduction to each unit, a statement of specific objectives to be obtained, a suggestion for optional study procedures, and a listing of potential study questions. The student proceeds at his own pace. Periodic testing indicates progress and mastery of the unit material, and results of tests determine when a student is ready to advance to another unit. A proctoring system is used during quizzes to supervise and help the students. Emphasis is placed upon completely mastering each unit before proceeding further in the course. (JD)

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PERSPECTIVES

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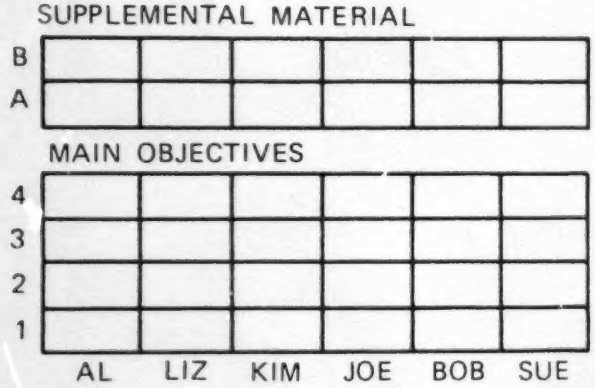

The Keller Plan: A Method for Putting the Responsibility of Learning Upon the Student

Suppose someone guaranteed a method of teaching that would help your students improve their study habits, give them a more positive attitude toward testing, enable them to worry less about final grades and increase their desire to hear lectures. As a college instructor, would you consider using it? This paper attempts to show the advantages of one such method and to describe how it overcomes certain problems in teaching.

The method referred to goes by several names, of which the most common is the Keller Plan. It has also been called Individualized Instruction, Personalized System of Instruction and Modular Instruction. The Keller Plan is named after psychologist Fred Keller, who was among the first to apply individualized instructional techniques to the college classroom. His plan is a method of teaching which includes breaking the material of the course into several units. Although the exact number of units will vary according to the specific course and particular needs, in general it entails dividing the material into units one to two weeks long. As each unit of material is covered, specific learning objectives are given to the students. These state exactly what the student must know to pass a unit quiz.

Learning objectives are important in organizing a Keller course. One objective for an English class might be to explain how metaphors are used by a certain writer in one of the author's works. Another objective would have the student know certain definitions and concepts used in the course material.

When the student has become prepared on a unit's material and has completed the learning objectives, he or she then goes to the designated area and takes the unit quiz. Often, the quiz will be of the short-answer type. Upon completion, a student proctor corrects and goes over the results with the student. The quiz and student proctor function as a test of student understanding. If some answers are unclear, the proctor first questions the student to determine what was meant by the answer (or by selection of a multiple-choice item) and then decides whether or not the answer is correct. This allows the proctor to better determine if the student understood the question or to clarify an ambiguous response.

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If the student shows mastery of the material—usually defined as a score ninety percent or better on the quiz—the student goes on to the next unit and prepares for the next quiz. Students who perform at less than ninety percent go back over the material and the learning objectives until they are prepared to take a second quiz. Students are allowed to take as many quizzes as necessary at no penalty toward their final grade, until they have mastered that unit.

The reason mastery of the material is usually set at ninety percent or better is to insure that students have sufficiently learned the current material before moving on to new. If the criterion is too low or too high, the student will either be able to pass the quiz without sufficient knowledge to cor e effectively or will not pass the quiz when he is, in fact, ready to go on. Setting the critical l n quizzes at ninety percent seems to emphasize t students the use of quizzes as stages in their development.

	SUPPLEMENTAL MATERIAL					
B						
A						
	MAIN OBJECTIVES					
4						
3						
2						
1			1-28	1-29	1-27	
	AL	LIZ	KIM	JOE	BOB	SUE

The progress of the students is graphed and displayed, usually by student number to maintain anonymity, in a prominent place. This allows the students to know exactly where they stand on any given day, in relation to the grade they are striving to receive for the course.

When a designated percentage of the class have passed a unit's quiz, a lecture or demonstration is given by the instructor. The lecture or demonstration is optional and the students are not tested on the material. However, this period allows the instructor to go into greater detail than the text on a certain topic or to clarify a subject which was difficult for the students to understand. Thus, this optional period becomes a reward for passing the quiz and is freely attended by interested students.

This format continues for the duration of the course. The student must pass the quiz over a body of material before being allowed to continue on to the next unit. If the instructor wishes to use mid-terms and finals, he or she may treat these as one unit of material, which also serves as a review unit for the students. Another method is to not use compulsory mid-term or final examinations and simply to consider the material mastered when the student passes the unit quiz.

Differences of the Keller Plan

There are several differences between this method and a more conventional approach to teaching. For instance, the Keller Plan provides study guides which include an introduction to the unit, a statement of specific objectives to be obtained, a suggestion for optional study procedures, and a listing of potential study questions. Opposed to this is the traditional method where the student reads several chapters for a major test but is uncertain which material is important. In the Keller approach the students are told, via the learning objectives, what the instructor wants the student to know. Students are then tested on their mastery of important material.

Another difference is that there is no penalty for not passing a quiz. This greatly facilitates the use of tests as learning instruments and rids them of their anxiety-producing qualities. Students who have completed a course taught by the Keller method report less test anxiety in other non-Keller courses, apparently because they are not penalized for non-mastery of material and perhaps because they are introduced to a greater number of tests in the Keller method. Students are allowed to go at their own pace and advance at a rate commensurate with ability. For students who are faster than average, this allows them to complete the course sooner than they would be able to in a conventional class where they are paced by the instructor's lectures. For the slower student, the Keller method allows them to learn sufficiently without being rushed, and without slowing down those who may advance faster.

An important feature is that students must master the material before being allowed to proceed, rather than moving on to new material even if the old is not yet learned. The Keller Plan can be very useful in classes where new material builds on concepts previously learned. The lectures and demonstrations, used as motivation for the students, can provide an in-depth review of a topic, not merely a repetition of the material in the textbook.

Instructors in the Keller Plan are responsible for selecting and organizing the material used, writing study guides, and constructing quizzes. They give fewer lectures and demonstrations than in a regular class, which frees time for more student-teacher interaction.

Proctors are also one of the essential features of the Keller Plan. Normally they are chosen from students who have taken the same course and passed with a high grade. Many times, the proctors will have taken the course during the previous semester or quarter; material will still be fresh in their memories. The duties of the proctors are to evaluate quizzes as satisfactory or unsatisfactory, prescribe remedial steps for students encountering difficulties with the material, and offer support and encouragement for beginning students. The use of proctors allows the instructors to offer repeated testing of the students and to have immediate scoring of quizzes so that the students may know promptly after the quiz how well they did.

Another definite advantage which results from using proctors is their enhancement of the personal-social aspect of the educational process. The use of a proctor allows the student to have a one-on-one interaction with the proctor. This personal interaction allows the student to know the proctor as a person as well as giving the student a feeling of being recognized as an individual. If questions about the material arise, the student can immediately receive an answer from the proctor. The proctor also gains a better grasp of the material by answering questions, asking questions of the instructor, and then relaying the answers to the student. In post-course questionnaires, the use of student proctors has been rated as one of the best benefits of the Keller Plan.

Despite the advantages of proctors, it must be realized that their knowledge of the material is close to the level of the students they are teaching. If the proctors are used effectively this should not be a problem, but instructors should not expect the proctors to have the level of comprehension of the material that they have.

SUPPLEMENTAL MATERIAL

B						
A						

MAIN OBJECTIVES

4						
3						
2	2-27		2-10		2-3	
1	2-5	2-10	1-28	1-29	1-27	2-3
	AL	LIZ	KIM	JOE	BOB	SUE

A compromise needs to be found between having too few proctors and having too many to manage. In the former situation there will be the same problems that plague the lecture class: formality, impersonality, little student-teacher interaction. And the number of re-tests may be limited. In the latter case, there may be more proctors than the instructor can organize effectively to deal with the students while keeping some control over the proctor's actions. Other potential difficulties include irregular proctor attendance and tardiness, achieving a uniform grading of exams, and insuring that quizzes are graded on knowledge of the material and not on the basis of friendship. These can be controlled by a periodic checking of the exams and by occasionally observing the proctor-student interaction.

Students who complete a Keller Plan course report learning more than do students in a conventional course. Keller Plan students also study more per week than do other students, as reported on end-of-course questionnaires, and they do better on achievement tests than do traditionally-taught students.

Since the Keller Plan provides clear specifications of grading criteria, it is possible for nearly all of the class to achieve those specifications. However, the use of the Keller Plan does not merely enhance simple memorization; it can also help develop higher-level thinking and can increase the motivation for further learning. What the student can learn from a Keller course depends upon how the course is structured by the instructor. If text material is important, the instructor constructs objective tests which cover the material and tells the proctors to concentrate on the learning of content. In courses where creative thought beyond the text or the ability to solve problems is important, the quizzes should be constructed in a way to require thoughtful answers. For example, longer essay questions or short-answer essays can be used to raise questions which require integration of the material or other creative thought about the topic. In these cases proctors emphasize higher-level thinking, rather than memorization, in their interactions.

An emphasis is placed before the students to retain material once it is learned and to use critical thinking throughout the course. The Keller Plan also demands a greater mastery of the work assignments, since students must learn the material in greater detail and they must obtain a greater understanding of basic concepts. This gives the student a greater feeling of achievement throughout the course.

The psychological literature on learning indicates that spaced practice often results in more efficient performance than massed practice. The Keller Plan

causes students to study one unit at a time (spaced practice) whereas conventional courses allow students to refrain from studying until the last week before the examination (massed practice), when they will be forced to study several units of material at once. By forcing the students to study one unit at a time, the Keller Plan results in better performance by the student than does the traditional design.

The quiz becomes an instrument which allows students to evaluate their deficiencies in the unit's material and permits them to go back and correct those deficiencies while preparing for the next quiz. All of this is done without excessively punishing students for deficiencies.

Students are given nearly immediate knowledge of their results on quizzes. Feedback is frequent and rapid. As opposed to other courses where their standing in the course is very often uncertain and feedback may be delayed by over a month, in the Keller Plan students know exactly where they stand each day in relation to their final course grade.

Students are competing against a goal which they set for themselves and not against each other, as often happens when graded on a "curve", because the grade is determined by performance on quizzes, not by how the rest of the class does in relation to that student. Since the teacher is freed from the demands which accompany preparation and delivery of a daily lecture or demonstration, there is a greater opportunity for student-teacher interaction which, of course, enhances the personal and social aspects of education.

If you consider education a means whereby students learn what they want to learn and the major responsibility for learning is placed upon the student, then the Keller Plan could be an extremely useful technique to use. The teacher must set up the class to enable learning to occur efficiently, but it is the student's responsibility to learn the material. By using the Keller Plan in the college classroom the teacher puts the responsibility for learning where it belongs: upon the learner.

Developing a Keller Plan Course

In addition to the techniques which I will discuss immediately following this, probably the single most important prerequisite for initiating a successful Keller Plan course is the motivation and enthusiasm to make it work. I have personally been involved in two variations of the Keller Plan with different instructors —the first taught by an enthusiastic instructor and the other by someone not very concerned about the course. The first course was a great success. The other course caused as much student dissatisfaction as Keller courses usually cause enthusiasm. One possible reason for this is that the mood of the instructor is transferred to the proctors who, in turn, pass it on to the class. Enthusiasm can motivate a class; apathy can leave a class uncommitted to learning. In a teaching method like the Keller Plan, where the responsibility for learning is placed upon the student, a wrong atmosphere can ruin the entire approach.

	AL	LIZ	KIM	JOE	BOB	SUE
SUPPLEMENTAL MATERIAL						
B						
A						
MAIN OBJECTIVES						
4						
3			2-24	3-3	2-19	
2	2-27	2-27	2-10	2-20	2-3	2-25
1	2-5	2-10	1-28	1-29	1-27	2-3

Another requirement of the Keller Plan is that the teacher put more time into preparing a Keller course than into a conventional one. The unit material must be reviewed and the important elements must be determined. Study objectives specifying the more important material must be prepared and several tests must be constructed for every unit. In trade for the initial time-investment, time will be freed during the course from lectures and demonstrations. After the initial preparation, the same course materials may be used when the course is offered again. This will probably mean that after the initial preparation, the instructor will have more free time, yet still maintain all of the benefits of the Keller method.

For the Keller Plan to be successful, it must be administered well. This requires proper training of student proctors, a system of immediate feedback, quizzes which test the material adequately, and sufficient student-teacher or student-proctor interaction.

Some courses using the Keller Plan have resulted in higher-than-average withdrawal rates. This appears to be primarily due to students initially falling behind the average pace of the class and feeling that they couldn't possibly catch up. This can be dealt with by breaking the course into even smaller units of material and/or publishing a recommended pace to help the students better gauge their time. There should also be

no penalty for retesting by students, to encourage them to learn the material regardless of the pace.

The use of feedback can be motivation for future learning. Short-term feedback allows students to immediately assess performance and to judge the extent to which mastery of the material has been achieved. Of course, the more feedback given to the student, the more information he has against which to evaluate his performance and to modify it if necessary.

Variations

Several instructor-related options are available for use with the Keller Plan. Rather than having one instructor for a class, teams of teachers can work together to teach more than one course simultaneously. This helps increase the interaction of students and teachers and it also allows the instructors to serve as resource persons covering a broader area than one instructor could. Another possibility is to place the optional lectures or demonstrations on video tape. This allows the instructor the options of either showing the tapes at announced times or of making them available to students in a central location after they have mastered a certain amount of material. The optional class sessions are not necessarily used for lectures or demonstrations. These periods may serve to answer questions or to let the students share their reactions to the material. Another possible variation is to make the optional classes contingent upon the student passing several units of study. This makes the lecture or demonstration a reward for getting good grades.

There are also variations which can be used with the student proctors. The proctors need not be undergraduate students. Graduate students may be used as proctors. Depending upon the nature of the material, that may be more beneficial.

If the class is small, one or two proctors will often be sufficient. The number of proctors in a Keller class will depend upon the number of students and upon how much time the instructor feels the proctors should have with them. If the student-to-proctor ratio is too great, the amount of interaction will necessarily have to be reduced. Another option would be to have students who perform well on the first few units act as proctors for those working at a slower pace. This student and proctor combination can be continued throughout all units of the course. A method of keeping the proctor's performance at a high level would be to make the final grade contingent upon how well the students he or she is working with perform on mastery exams or the final exam. This should be worked out between the instructor and proctor during their initial meetings.

It is also possible to vary testing techniques. Students could be graded not only on whether or not they give the correct answers, but also on how fast they can respond. This unconventional method has been used with satisfactory results, and students have rated this variation as better than that of most other courses they were in. The instructor can also decide when each unit of material must be completed. The instructor can either allow relatively unlimited time to complete each unit, or a specific amount of time can be set.

There may be no need for a mandatory final exam. If the students perform well on the mastery quizzes, the final exam may be made optional. However, for those students who need to retake the mastery exams several times before successfully completing them, the final may be used as a last test of their mastery of the material. The public posting of student performance in terms of how many units each student

	SUPPLEMENTAL MATERIAL					
B						
A					3-20	
	MAIN OBJECTIVES					
4	3-24		3-24		3-11	3-20
3	3-17	3-12	2-24	3-3	2-19	3-13
2	2-27	2-27	2-10	2-20	2-3	2-25
1	2-5	2-10	1-28	1-29	1-27	2-3
	AL	LIZ	KIM	JOE	BOB	SUE

has completed and the completion date could serve as a motivational device. This would also allow the students to gauge individual performance against their ultimate objective for the course. It would be wise to post the performance by student identification numbers to maintain anonymity.

If it is not already obvious, the Keller Plan requires a good deal of work by both student and teacher. It is not some kind of magical formula which, when applied to the classroom, makes all our woes disappear. However, like other systems of instruction which require sufficient input from preparation to receive equivalent output as results, the Keller Plan requires more than average preparation by both faculty and students. The result is student feelings of achievement

and mastery of the material—more than in conventionally taught classes. For the teacher there is satisfaction in the accomplishment of a primary goal of education: the transfer of information and the enhancement of critical thinking by students in the area taught.

The Keller Plan, and modifications of it, have been initiated and conducted successfully in virtually every college discipline. In some universities, copies of the initial preparations of the Keller Plan are available as references for those who might consider using the Keller Plan in their class. It has been the product of much research which indicates, in general, that the Keller Plan is at least equivalent to conventional methods of teaching. In more cases than not the Keller Plan has resulted in better than average performances by the students. Even more impressive is the fact that the improved performance of students carried over to other courses taught in conventional methods and that achievement test scores were improved for those students who took a Keller Plan course.

In summary, the Keller Plan is a method of structuring a course so as to achieve high efficiency in terms of student learning. Proctors are used as resources for the students and as a method of increasing the amount of student-teacher interaction. The material is broken into smaller units to encourage students to better master the material. Learning objectives are passed out with the purpose of enabling students to concentrate on important material. Anxiety is removed from the testing situation by allowing retesting as often as necessary, yet mastery of the material is required. Lectures and demonstrations are optional and function as rewards for passing the quiz.

It should not be surprising that the Keller Plan has had such considerable success if one considers the fact that the students study more, on the average, than the conventional classroom students, and that students actively engage in the subject matter through

SUPPLEMENTAL MATERIAL

B					3-31	
A			3-27		3-20	3-28

MAIN OBJECTIVES

4	3-24	3-26	3-24	3-26	3-11	3-20
3	3-17	3-12	2-24	3-3	2-19	3-13
2	2-27	2-27	2-10	2-20	2-3	2-25
1	2-5	2-10	1-28	1-29	1-27	2-3
	AL	LIZ	KIM	JOE	BOB	SUE

interactions with the proctors and the quizzes. This method places the responsibility for learning upon the student and causes the student to master the material independently at his own pace. In short, the Keller Plan is a method of applying effective learning principles to the classroom.

The following readings, of varying quality, are of interest in connection with this article:

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—*Mike Naumes*